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**THE HEALTH CARE SYSTEM IN CANADA:  
EFFECTIVENESS AND EFFICIENCY**

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**October 1993**



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## **THE HEALTH CARE SYSTEM IN CANADA: EFFECTIVENESS AND EFFICIENCY**

### **INTRODUCTION**

Controlling health care expenditures has for several years been a political objective in Canada. The provincial governments already allocate a considerable portion (approximately one-third) of their budgets to health care. The difficult economic situation, combined with the freeze on federal Established Program Financing (EPF) transfer payments, has tightened the financial restraints on provincial governments. In fact, public health care expenditures have reached a threshold that, politically, seems difficult to cross.

From this perspective, many authors have addressed the so-called funding crisis in Canada's health insurance system and the fact that it may become impossible to preserve national health care principles such as universality and free access. More and more, the way that health care costs are shared between the public and private sectors is being called into question. Indeed, some observers claim that the list of services now considered medically necessary and covered by the public systems must be reviewed, or user fees imposed.

On the other hand, others maintain that controlling health care costs does not require increased private-sector participation in funding health care but, rather, a more effective and efficient health care system. They argue that the delivery of appropriate and clinically and economically effective health care services contributes to the efficiency, or performance, of the health care system. Effective care in an efficient system makes it possible, first, to make optimum use of available financial resources and, second, to deliver universal, high-quality services.

In this paper, we discuss some theoretical and practical aspects of effectiveness and efficiency in health care. After defining those concepts, we go on to list some health

services that, in practice, are considered ineffective, and to examine the solutions being considered to remedy the situation.

## EFFECTIVENESS AND EFFICIENCY: CONCEPTS AND DEFINITIONS

Effectiveness and efficiency are two concepts that add an economic dimension to health care. Applying economic theory to health care is an effort to address the issues of allocating physical, human and financial resources and setting priorities in the budget decision-making process. The first issue, related to the concept of efficiency, is to determine the optimum amount to be allocated to health care; this depends on the extent of resources to be allocated to meeting society's other needs. In addressing this issue, we must make a choice: what portion of the budget is to go to health care and what portion to other, equally important, public investments such as education, job creation, and research and development? The second issue, also related to efficiency, is how to allocate resources among the various components of health care, for example, preventive care, curative care and medical research. The third issue is to identify activities considered effective and for which funding assistance is to be provided, taking into consideration the limitations determined and priorities set in addressing the two preceding issues. Before assessing the system's efficiency from a macroeconomic point of view, we should identify the activities that are effective from a microeconomic perspective.

**Effectiveness** is the relationship between the level of resources invested and the level of results, or improvements in health. Assessing effectiveness consists of measuring the effects of medical practices and techniques -- therapeutic, diagnostic, surgical and pharmacological -- on individuals' health and wellbeing. This must take into consideration not only observed improvements in health but also negative impacts, such as side effects and iatrogenic effects.<sup>(1)</sup>

In its pure form, assessing effectiveness compares two things that have the same effect or the same purpose. If two drugs are each used to treat a particular illness, the more

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(1) Sylvie Rheault, *Financement des services de santé: Défis pour les années 90*, Conseil des affaires sociales, Government of Quebec, 1990, p. 104.

effective drug will be the one that treats the illness more quickly with fewer side effects; it is called the more clinically effective drug.

The economic dimension of effectiveness introduces the concept of cost, and thus refers to cost-effectiveness and cost reduction. For example, if two drugs have the same effects in all respects (the same duration of treatment and the same side effects), the more economically effective drug is the one that costs less.

Broadly applied, effectiveness combines both the clinical and economic aspects of health care. Assessing effectiveness makes it possible to determine the medical practices and techniques that, first, actually help improve health and, second, make good use of resources. Since resources allocated to health care are limited, only effective practices and techniques should be used.

As a corollary, the clinical and economic assessment of health care allows us to determine which services are ineffective or inappropriate. A service is considered clinically ineffective if it does not have the desired effect, such as treating or detecting illness or improving health. A service is considered economically ineffective if it produces only a minimal improvement in health for its cost. A medical procedure is considered inappropriate if it has no beneficial effects, or even has undesirable effects, on the patient's health. Health care expenditures can be controlled better when we stop funding inappropriate or ineffective services.

Assessing effectiveness is not limited to comparing two similar things, such as two drugs or two diagnostic tests; it can also be applied to different fields. For example, we can compare the cost of prevention with the cost of using drugs,<sup>(2)</sup> home care with hospital care,<sup>(3)</sup>

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(2) A. Füller, V. Schumann and U. Laaser, "Attitude and Behaviour of Stuttgart's Primary Care Physicians with Regard to the Pharmacological and Non-Pharmacological Treatment of Mild Hypertension," *Costs and Benefits in Health Care and Prevention: An International Approach to Priorities in Medicine*, Conference on Cost-Benefit Analysis in Health Care, Berlin, Heidelberg, Springer-Verlag, 1990, p. 41-50.

(3) Readers may consult William G. Weissert, "Cost-Effectiveness of Home Care," a summary of 27 American studies, p. 89-98, or Evelyn Shapiro, "There's No Place Like Home," a Manitoba study, p. 99-104, in *Restructuring Canada's Health Services System: How Do We Get There From Here? Fourth Canadian Conference on Health Economics*, Raisa B. Deber and Gail G. Thompson (eds.), Canadian Association for Research on Health Economics, Toronto, University of Toronto Press, 1992.

care by a physician with care by another health professional,<sup>(4)</sup> or a new technique with existing medical practices.<sup>(5)</sup>

Assessing effectiveness is sometimes easy and sometimes difficult. For example, the choice between an expensive drug and a low-cost drug is fairly clear when the effects are expected to be essentially the same. The choice is more complicated, however, when a lower-cost drug entails longer treatment or has more side effects. Such a choice cannot be made on economic criteria alone. That is why clinical and economic assessment must both be applied in assessing effectiveness. Effectiveness in the health care system continues to have two elements: the greatest possible improvement in health at the best possible cost.

**Efficiency**, a much broader concept, is the relationship between the level of resources invested in the health care system and the volume of services, or, what amounts to the same thing, improvements in health achieved.<sup>(6)</sup> The purpose of efficiency is to maximize results effectively, or services delivered, given a particular budget. According to this concept, each service must be delivered at the lowest possible cost, have benefits of value equal to or greater than its cost, and make optimum use of the resources invested. Efficiency is distinct from effectiveness in that it considers costs in relation to benefits.

Assessing the efficiency of medical treatments and techniques makes it possible to set priorities when allocating resources. For example, let us assume that the government has a budget of \$1 million to purchase drugs proven to be effective against fatal illnesses.<sup>(7)</sup> Let

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- (4) For example, see M. Modan, Z. Fuchs and J.B. Rosenfeld, "Evaluation of Cost-Effectiveness of Physician-Nurse Teams as Compared to Physicians Working Alone in Primary Care Practices in Community Control of Hypertension," *Costs and Benefits in Health Care and Prevention: An International Approach to Priorities in Medicine*, Conference on Cost-Benefit Analysis in Health Care, Berlin, Heidelberg, Springer-Verlag, 1990, p. 57-71.
  - (5) D. Feeny, Gordon Guyatt and Peter Tugwell (eds.), *Health Care Technology: Effectiveness, Efficiency and Public Policy*, Canadian Medical Association and Institut de recherches politiques, Montreal, 1986.
  - (6) Rheault (1990), p. 2.
  - (7) Other interesting examples are given in: Conference on Cost-Benefit Analysis in Health Care, *Costs and Benefits in Health Care and Prevention: An International Approach to Priorities in Medicine*, Berlin, Heidelberg, Springer-Verlag, 1990; Anthony J. Culyer, *Health Care Expenditures in Canada: Myth and Reality; Past and Future*, Canadian Tax Paper No. 82, Canadian Tax Foundation, 1988, Chapter 5.

us also assume that, in the opinion of experts, 50 lives could be saved if this entire budget were spent on drug A, but 100 deaths could be prevented if it were spent on drug B. Which drug should the government purchase? According to efficiency criteria, the government should spend its budget to purchase drug B, whose benefits -- the number of lives saved -- are higher. Although in this example we are comparing costs in dollars and benefits in numbers of human lives, benefits are often quantified in monetary terms.<sup>(8)</sup>

Assessing efficiency is not limited to clear-cut benefits, however; in fact, we must take marginal benefits into consideration. Let us return to the example of drug A and drug B, assuming this time that the government has a budget of only \$500,000. In the opinion of experts, 40 lives could be saved if this entire budget were spent on drug A, but 80 lives could be saved if it were spent on drug B. Here again, the government should give priority to drug B. However, in light of this most recent information and from the perspective of efficiency, if the government's budget were increased to \$1 million, would it be better to spend the entire budget to purchase drug B and prevent 100 deaths, as initially proposed in the first example? Obviously not. If the government purchased only drug B, the additional \$500,000 would save only 20 additional lives. If the government used the additional \$500,000 to purchase drug A, however, it could save 40 additional lives. Overall, then, it would be more efficient to allocate the budget equally between drug A and drug B. By doing so, the government would prevent a total of 120 (40 + 80) deaths, while by purchasing only drug B, it would save only 100 lives; by adopting the former solution, the government would maximize results.

Assessing efficiency helps us when choices must be made from various medical practices and treatments. Marginal benefits must always be taken into consideration. Is the marginal efficiency of treatment A greater or less than that of treatment B? Or must a choice be made between the present and the future? For example, is it better to allocate more money to treatment of an illness or to research to find a complete cure for it? Assessing efficiency is an effort to compare the costs and benefits for society as a whole and to highlight the economic effects of public expenditure options so that governments can ascertain which additional investments maximize net benefits.

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(8) In a given budget, when both costs and benefits are measured in monetary terms, priority must be given to projects or activities with higher unit cost-benefit ratios.

We must also accept the fact that efficient allocation of resources grows out of a choice that will always have moral and societal dimensions. Should money be invested in equipment to treat rare cases, or in preventive programs that benefit thousands of people? What priority should be given to services that do nothing to alter the course of an illness but improve the quality of life? Should priority be given to services for children, or services for senior citizens; to physical, or mental problems? Why are some individuals rather than others selected to receive a particular treatment? Answering these questions will always be difficult. Along with clinical and economic concerns, ethical considerations should be part of the budget decision-making process.

Efficiency could also be assessed from a macroeconomic perspective in an effort to determine the proportion of resources to be allocated to health care. In this case, however, it is obviously easier to define a theoretical criterion of macroeconomic efficiency in health care than to demonstrate what is or is not, in current practice, optimum allocation of health care resources at a cost considered acceptable for society. No one has yet determined the optimum proportion of resources or the ideal percentage of the Gross Domestic Product (GDP) that governments should allocate to health care expenditures. There seems to be no standard, as is shown by the variation in proportions of GDP allocated to health care, and the importance of the public health care sector, in various countries. Which country has the ideal system? There is no real answer to this question. According to Evans, "There is ... no basis, in the international experience, for concluding that one form of organization or finance has 'worked' and shown a conclusive superiority over the others."<sup>(9)</sup> In Evans's opinion, countries have not paid enough attention to effectiveness or responsibility in health care funding; he therefore concludes that "despite their diversity, health care systems have all evolved without mechanisms to assure accountability for the effectiveness, efficiency and appropriateness of care provided."<sup>(10)</sup>

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(9) Robert G. Evans, "Health Care Reform: The Issue from Hell," *Policy Options*, Vol. 14, No. 6, July-August 1993, p. 36.

(10) *Ibid.*, p. 39.

## THE SITUATION: INFORMATION AVAILABLE

It is anticipated that Canada, like several other countries, will pay more attention in future to effectiveness and efficiency in order to streamline its health care system. According to a study published by the Organisation for Economic Co-operation and Development (OECD):

We are entering an age, therefore, where questioning will be axiomatic in health care provision. New techniques will no longer be universally implemented without evaluating value versus costs. Even common procedures will come under more intense scrutiny as the need for justification increases.<sup>(11)</sup>

This trend toward more systematic assessment of effectiveness and efficiency is justified from four points of view. First, greater effectiveness and efficiency alleviate some funding problems of public health insurance systems; second, more effective delivery of services directly improves their quality; third, more effective health care directly contributes to improvements in health; fourth, effectively delivered health care makes the system more efficient.

However, there are some barriers to systematic assessment of the effectiveness and efficiency of health care. Although economic theory offers some useful tools, Canada does not always have enough information to carry out such assessments. The scarcity of indicators for measuring improvements in health and the shortage of information on the effects of medical treatments make it difficult at present to assess the effectiveness of care and the overall performance of the health care system.

First, there are few ways to measure improvement in health following medical treatment, so the effects of the health care system are still often unknown. One reason is that it is not always easy to dissociate the effect of the treatment itself from the effects of other influences. Indeed, health depends on a great many interrelated factors, and we are not able to ascertain unequivocally the specific influence of health care on health.<sup>(12)</sup> Another reason is

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(11) Klim McPherson, "International Differences in Medical Care Practices," *Health Care Systems in Transition: The Search for Efficiency*, Social Policy Studies, No. 7, OECD, 1990, p. 17.

(12) André-Pierre Contandriopoulos, quoted in Sylvie Rheault (1990), p. 104.

that we have no bank of information on patients who have received treatment. For example, it is often impossible to assess the effectiveness of hospital care because there is no follow-up after the patient leaves the hospital. Some writers even suggest that is impossible to measure the cost-effectiveness of hospital care:

[...] the accounting approach now used in funding nearly all [hospital] operations, does not let us know how effectively the resources invested in hospitals contribute to results in terms of health and wellbeing. It is pointless to produce effectively something useless or something that could be produced under different conditions. Although present information systems give us partial information about the services produced, they say nothing about results. [translation]<sup>(13)</sup>

Second, we still know little about the effectiveness of medicine and even less about the cost-effectiveness of many treatments. According to former Minister of Health and Welfare Benoît Bouchard, the cost-effectiveness of 70% of new medical techniques has not been assessed.<sup>(14)</sup>

Despite the lack of data, there is some information on the ineffectiveness of certain drugs, diagnostic tests and surgical operations, which we summarize below.

A number of studies call into question the clinical and economic effectiveness of drugs. Rheault states that nearly half the drugs now on the market in Canada have never been assessed: "of the 3,500 types of drugs now available in Canada, 1,500 were put on the market before 1963, before systematic assessments began" [translation].<sup>(15)</sup> Worldwide, some 100,000 different drugs exist, of which the World Health Organization (WHO) considers only 270 to be essential.<sup>(16)</sup>

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(13) André-Pierre Contandriopoulos, Anne Lemay and Geneviève Tessier, "Les couts et le financement du système socio-sanitaire," *Programme de recherche: recueil de résumés*, Commission d'enquête sur les services de santé et les services sociaux, Government of Quebec, 1987, p. 372-373.

(14) Benoît Bouchard, Speech, *Hamilton Spectator*, 14 May 1993, p. A-9.

(15) Rheault (1990), p. 108.

(16) "Campaign Launched Against Harmful, Ineffective Drugs," *Toronto Star*, 18 September 1993, p. F-8.

Some observers are also concerned about certain prescription drugs. For example, international comparisons show that for patients with throat and ear infections, Canadian physicians prescribe antibiotics more often than do their counterparts in various European countries. It seems, however, that the treatment period is approximately the same, with or without antibiotics. Similarly, Canadian physicians tend to prescribe drugs for patients with colds, although such drugs are unnecessary. It seems that physicians seek to respond to the demands of their patients, who insist on these drugs. Ontario spends approximately \$200 million in physicians' fees each year to treat patients with colds.<sup>(17)</sup>

Some diagnostic tests and medical examinations are also being called into question. For example, Gibson considers that cholesterol-level tests and treatments for high levels of cholesterol are out of control in North America. In his opinion, the benefits of these tests and treatments are minimal and sometimes unproven. He also claims that ultrasound tests during normal and low-risk pregnancies are probably of no benefit; in Ontario, however, an average of two ultrasound tests are performed during each pregnancy. Gibson recognizes that women patients often demand these tests and that ultrasound is now recognized as a routine medical practice.<sup>(18)</sup> The annual estimated cost of ultrasound tests in Ontario is some \$25 million.<sup>(19)</sup> Gibson also thinks that too many X rays of minor injuries and too many mammograms are being performed. He also considers that medical examinations of healthy babies could be performed more economically by nurses adequately trained in this field. Lastly, he states that several procedures forming part of the traditional annual medical examination have no proven benefits.<sup>(20)</sup>

Finally, other observers consider that the rate of certain surgical operations in Canada is too high in comparison with that in other countries. Rheault notes: "It is interesting

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(17) Dr. Gary Gibson, "Doctors Must Choose the Way to Go," *Globe and Mail* (Toronto), 18 June 1993, p. A-17.

(18) *Ibid.*

(19) According to a study carried out in the United States, ultrasound is often unnecessary, since 80% of pregnant women have low-risk pregnancies. See: Associated Press, "Study Finds Routine Ultrasound Unnecessary for Most Pregnancies," *The Gazette* (Montreal), 16 September 1993, p. B-1.

(20) Gibson (1993).

to note that the WHO considers a Caesarian section rate of between 10 and 12% acceptable. The rate in Quebec is 19%. Let us add that the episiotomy rate considered acceptable by the WHO is 20%, while the rate in Quebec is 64.7%" [translation].<sup>(21)</sup> In Rheault's opinion, some medical practices have proven to be completely ineffective and very expensive:

In Manitoba, a team of researchers studied 2,000 patients who had had their gall bladders removed. The study showed that more deaths resulted from gall bladder removal than from not having this operation performed. In 1983, 50,000 gall bladder removal operations were performed in Canada at a cost of between \$75 million and \$100 million. If lost working days and deaths resulting from the negative effects of these operations are included, annual costs amount to \$200 million. [translation]<sup>(22)</sup>

Similarly, an article indicates that 40% of back operations are of no use, since the problems could be solved without surgery. This article also points out that some surgical operations such as hysterectomies, coronary artery bypasses and cataract operations are not always necessary.<sup>(23)</sup>

Examples of ineffective health care are not limited to strictly medical treatments. There is also ineffectiveness in management of the public health insurance system. For example, according to a report prepared by the Ontario Ministry of Health, nearly \$1 billion is paid out on health care as a result of fraud.<sup>(24)</sup> According to this report, there are several forms of health care fraud: some persons use health insurance cards illegally; over 100,000 persons have two health insurance cards; nearly 500,000 health insurance card users are not eligible for the public health care system; some patients use the health insurance cards of deceased persons; and some social assistance beneficiaries evidently profit from the drug insurance system by reselling their drugs on the black market.

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(21) Rheault (1990), p. 110.

(22) *Ibid.*

(23) Linda Heller, "When to Say No to Surgery," *Chatelaine*, October 1993, p. 99.

(24) Diane Francis, "Ontario Health System Open to \$980 M in Fraud," *Financial Post* (Toronto), 6 August 1993, p. 4.

Overall, experts agree that making Canada's health care system more effective requires participation by patients, physicians and governments. Gibson, for example, argues as follows:

Physicians, patients and government must all share the blame for what's wrong with Canadian health care. Much of what is being done is wasteful and/or useless -- many "treatments" have never been properly studied to know whether they are effective or harmful.<sup>(25)</sup>

Various solutions have been suggested for making health care and the health care system more effective. Patients must be clearly informed which services are effective, so that they do not exert inappropriate pressure on physicians to give them a service or drug that will not improve their health. It also seems that physicians should be given better information about the clinical and economic effectiveness of medical treatments, without calling into question their hard work in improving health and saving lives. It is generally acknowledged that decisions about effectiveness should not rest on the shoulders of individual physicians but, instead, be made by a monitoring and follow-up organization. Lastly, governments have an important role to play in disseminating information to patients and physicians.

In this regard, some provincial governments have found innovative solutions to problems of ineffectiveness and inefficiency. For example, the Manitoba Medical Review Committee has been responsible for reviewing methods of medical practice for several years in order to prevent and control "inappropriate service delivery" (defined as being a volume of services higher than the provincial average). This Committee asks physicians who seem to be delivering superfluous services to reduce the volume of the services they deliver. The physicians' methods of practice are then reviewed for several years in order to ensure that they are following the Committee's guidelines. It seems that the Committee has been effective in reducing excessive use of full or partial examinations, diagnostic tests, special calls and house calls. Indeed, a study carried out between 1984 and 1988 reported a decrease in the number of services delivered, a decrease that was not offset by increases in other services or in the number

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(25) Gibson (1993).

of patients. It is estimated that reviewing methods of practice has saved more than \$2 million over a four-year period.<sup>(26)</sup>

Similarly, Saskatchewan's Health Services Utilization and Research Commission publishes guidelines for medical personnel. Last year the Commission studied the cost-effectiveness of thyroid tests and then published guidelines limiting excessive use of such tests.<sup>(27)</sup> In its report, the Commission indicates that the number of thyroid tests decreased by approximately 30% after the guidelines were published.<sup>(28)</sup> It is estimated that this reduction in the number of thyroid tests has saved some \$1 million.<sup>(29)</sup>

In British Columbia, the government and representatives of the medical profession have reached an agreement in principle that should save \$370 million in health care costs over a five-year period. The purpose of this agreement is to limit abuse of the system and make care more effective. Physicians are to participate in an education program to inform and encourage the public not to make excessive use of the health care system. It is the patient who demands a test that the physician considers unnecessary, rather than the public health insurance system, that must pay for the test. Secondly, physicians are to help set up a process to review methods of practice and thus identify excesses. Physicians not complying with the guidelines are to bear the costs themselves.<sup>(30)</sup>

At their 1993 annual meeting, the federal, provincial and territorial Ministers of Health agreed to consider the possibility of establishing national guidelines on methods of medical practice.<sup>(31)</sup>

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(26) Dr. Michael Wahn, "Controlling Overservicing by Physicians: Review of Office Practices in Manitoba," *Canadian Medical Association Journal*, Vol. 146, No. 5, 1 March 1992, p. 723-728.

(27) Similar guidelines have been recommended in Ontario. For more details, see: Working Party on Testing Strategies on Thyroid Disease, *Report Presented to the Task Force on the Use and Provision of Medical Services*, January 1992.

(28) Government of Saskatchewan, Health Services Utilization and Research Commission, *Follow-Up Report: Thyroid Testing Guidelines*, August 1993.

(29) Rod Mickleborough, "\$1 Million to be Saved by Cuts in Thyroid Tests," *Globe and Mail* (Toronto), 31 August 1993, p. A-1 and A-2.

(30) Deborah Wilson, "BC Pact on Health Care Counts on Major Savings," *Globe and Mail* (Toronto), 1 September 1993, p. A-5.

(31) Robert Walker, "Physician Resource Plan Seen as Priority: Guidelines to be Shared by Other Provinces," *Medical Post*, 28 September 1993, p. 1 and 37.

## CONCLUSION

In this paper, we have theoretically defined the concepts of effectiveness and efficiency in health care and suggested that effectively delivered services make the system more efficient. In practical terms, we have seen that greater effectiveness and efficiency require proper use of resources, appropriate delivery of care and sound management of public health care funds. Since greater effectiveness and efficiency encourage proper use of financial, physical, and human resources, they help control health care costs. It seems difficult, if not impossible, to determine the optimum level of expenditures that should be allocated to health care; however, by using economic analysis, we can ensure that the budget is allocated to the most effective components of the system. Some provinces have already begun to meet the challenge of funding their health care systems by making them more effective and efficient. We must encourage the other provinces to do likewise.

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